

1 ABSTRACT OF THE DISCLOSURE

2 A method of forming a thin film transistor over a substrate is
3 provided whereby at least one of the source region or the drain region
4 is conductively doped while preventing conductivity doping of the channel
5 region without any masking of the channel region occurring by any
6 separate masking layer. A method includes, a) providing a substrate
7 having a node to which electrical connection is to be made;
8 b) providing a first electrically insulative dielectric layer over the
9 substrate; c) providing an electrically conductive gate layer over the
10 first dielectric layer; d) providing a second electrically insulative
11 dielectric layer over the electrically conductive gate layer; e) providing
12 a contact opening through the second dielectric layer, the electrically
13 conductive gate layer and the first dielectric layer; the contact opening
14 defining projecting sidewalls; f) providing a gate dielectric layer within
15 the contact opening laterally inward of the projecting sidewalls; g)
16 providing a layer of semiconductive material over the second dielectric
17 layer and within the contact opening against the gate-dielectric layer
18 and in electrical communication with the node; the semiconductive
19 material within the contact opening defining an elongated and outwardly
20 extending channel region the electrical conductance of which can be
21 modulated by means of the adjacent electrically conductive gate and
22 gate dielectric layers; and h) conductively doping the semiconductive
23 material layer lying outwardly of the contact opening to form one of
24 a source region or a drain region of a thin film transistor. Thin film

TOP SECRET

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

transistor constructions are also disclosed.